

### IN THE CLAIMS:

1. (currently amended): A process for producing a refractory oxide which comprises (a) reacting an aqueous hydrogen fluoride solution ~~or its derivatives~~ with: (1) at least one metal fluoride, or (2) at least one metal fluoride and at least one metal oxide, or (3) at least one metal oxide, to form either a blended dispersion which produces a cationically-homogeneous, nanostructured colloidal mixture, or a solution; (b) removing the liquid from either the colloidal mixture or solution and forming a dried product; (c) heating the dried product to produce a solid state metal hydroxyfluoride and volatile by-products; (d) further heating the thus-produced metal hydroxyfluoride to a higher temperature at which it chemically decomposes, by heat alone, into a cationically-homogeneous nanostructured solid state refractory metal oxyfluoride and volatile by-products; and performing one of the following heating steps: (i) heating the thus-produced metal oxyfluoride to a solid state decomposition-temperature at which it chemically decomposes, by heat alone, into a cationically-homogeneous nanostructured solid state refractory oxide; or, (ii) heating the thus-produced metal oxyfluoride to a molten state decomposition-temperature at which it chemically decomposes, by heat alone, into a cationically-homogeneous nanostructured solid state refractory oxide; or, (iii) heating the thus-produced metal oxyfluoride to a vapor state decomposition-temperature at which it chemically decomposes, by heat alone, into a cationically-homogeneous nanostructured solid state refractory oxide
2. (currently amended): The process of claim 1, wherein the reactants for step (a) comprise at least one metal fluoride.
3. (currently amended): The process of claim 1, wherein the reactants for step (a) comprise at least one metal fluoride and at least one metal oxide.
4. (currently amended): The process of claim 1, wherein the reactants for step (a) comprise at least one metal oxide.
5. (currently amended): The process of claim 1, wherein the reactants for step (a) comprise MgO; and, the heating of the oxyfluoride is at 1315°C to produce transparent MgO.
6. (new): The process of claim 1, wherein the reactants for (a) comprise Y<sub>2</sub>O<sub>3</sub>; and, the heating of the oxyfluoride is at 1470°C to produce transparent Y<sub>2</sub>O<sub>3</sub>.